

Valley crossing the Blue Ridge a little to the north of here. Showers occurred about here from 5 till 8 p. m., but could not see them on account of fog.

July 23.—8 a. m., 69°; 2 p. m., 77°; 10 p. m., 62°. Partly cloudy in a. m., with showers in p. m. From 5 till 7 p. m. a succession of ill-defined showers moved down the Shenandoah Valley. Fog obscured many of their movements; east winds prevailed.

July 24.—8 a. m., 66°; 2 p. m., 75°; 8 p. m., 68°. Partly cloudy, with moderate temperature and southeast winds. About 4 p. m. a shower developed to the south-southwest of here and moved north-northeast down the Page Valley. It was a light shower, with no thunder.

July 25.—8 a. m., 70°; 2 p. m., 79°; 8 p. m., 66°. Partly cloudy and slightly warmer, with east winds. It turned cooler at night. About 4 p. m. a shower with some thunder formed to the south of the gap and moved northeast with great rapidity, crossing the ridge immediately to the south of here; the northern edge passed over camp.

July 26.—8 a. m., 62°; 3 p. m., 68°; 8 p. m., 65°. Rain and fog in a. m., fair in p. m.; light south winds.

July 27.—8 a. m., 61°; 3 p. m., 69°; 8 p. m., 65°. Partly

cloudy, with brisk east winds in a. m.; east winds diminished, with fair weather in p. m.

July 28.—8 a. m., 63°; 3 p. m., 73°; 10 p. m., 64°. Fair; north to northeast winds.

July 29.—8 a. m., 64°; 2 p. m., 71°; 10 p. m., 64°. Fair in morning. Increasing cloudiness, with rising southeast winds in p. m. Light rain fell in the night.

July 30.—8 a. m., 64°; 3 p. m., 78°; 8 p. m., 68°. Cloudy in early morning, clear during the day; southwest winds prevailed, with slightly warmer weather. About 4 p. m. a shower formed to the north of the gap and passed southeast over camp, after which it dissipated.

July 31.—8 a. m., 68°; 3 p. m., 81°; 8 p. m., 69°. Partly cloudy and quite warm, with fresh southwest winds.

The gap spoken of is New Market Gap, 12 or more miles west of this place. Since June 16 the lightning has struck three times at this place, within an area of 100 acres, seemingly attracted by the wire fencing. The drought in the Page Valley was broken on July 19, but rain is very much needed now in this region. The general trend of thunder-showers is down the Shenandoah Valley, or northeastward toward of Riverton.

NOTES BY THE EDITOR.

ELECTRIC PHENOMENA IN THE EUPHRATES VALLEY.

On page 286 we publish an interesting letter from Mr. Ellsworth Huntington relative to lightning flashes passing between several of the mountain peaks bordering the wild gorge of the Euphrates 20 or 30 miles south of Harput (Charput). The Editor has endeavored to find a satisfactory map of this gorge, on which to locate the peaks referred to by Mr. Huntington, but the best that he has access to fails to mention them. He has, therefore, published with Mr. Huntington's article a copy of a portion of Kiepert's map of Asia Minor as reprinted in Petermann's Mitteilungen, Ergänzungsband 4, 1867, the latest edition of this map being inaccessible to him. On this map (see page 286) the reader will perceive the gorge or canyon, that extends, with many rapids and falls, for 40 miles above Telek and 20 miles below that place. The locations of Mr. Huntington's peaks and of other points given on his sketch have been transferred to this map as well as we were able to do. On either side of the gorge the country is an elevated plateau, 5,000 feet above sea level. The peaks numbered and named by Mr. Huntington are undoubtedly the remnants of the harder rocks left by the river as it cuts its channel deeper and deeper. The Lake Geuljik is believed to have an underground outlet and to be the head water of the great spring north of Telek, at which the river Tigris begins.

We need not apologize for refraining from attempting to find the correct explanation of the mysterious lightnings and thunders here recorded. It is well known that lightning passes between cloud and cloud or cloud and earth, but we have not yet any well authenticated case of its passing from peak to peak, although the poets describe it as "leaping from crag to crag." Byron is quite true to nature when he (in *Childe Harold*, Canto III, stanza 92), describing a thunderstorm on Lake Leman, says:

Far along
From peak to peak, the rattling crags among,
Leaps the live thunder.

There are peaks in the Rocky Mountains on which almost continuous electric discharges have been observed, but they pass off into the air quietly, like St. Elmo's fire, never in great flashes from peak to peak. During eruptions of

Vesuvius, the lightning passes from the mountain to the clouds of steam that have risen from the volcano, but not between neighboring peaks. In general, the air ordinarily offers such a resistance to the passage of electricity, while the earth is such a good conductor of electricity, that it would be easier for two electrified peaks to discharge through the earth than through the air. We can not, therefore, think of a lightning flash passing between two neighboring peaks. On the other hand, a cloud or a mass of electrified air that has not quite attained the cloudy condition may lie between two peaks, and flashes may proceed from it simultaneously to the two peaks in such a way as to lead a careless observer to say that one peak discharged over to the other. If this is the approximate explanation of the Euphrates phenomenon, then it will happen only when the wind is in certain directions, such as to cause the formation of an incipient cloud and thunderstorm between the two peaks, and this wind direction will depend upon the relation of the peaks to the course of the river valley below. But when we remember how easily myths spread and become common property, so that the same error is believed by everyone, generation after generation, until some scientific investigator probes it to the bottom and dispels the illusion; when we remember that Asia Minor has been the nursery for all the myths and wonders and miracles that fill the literature of Arabia, Greece, Rome, and modern Europe; when we remember that Mr. Huntington has not seen this phenomenon, but describes it on the authority of numerous credible natives, who state that it was seen by others years ago, we must be allowed to express the wish that he will continue his researches in that neighborhood until he has seen it and can describe it from personal experience. If it is a thunderstorm phenomenon, it can not be so very rare; but if it is a myth, based upon some historical event or some misinterpretation of ancient names, the explanation will be most interesting to students of history and philology.

NOTABLE LIGHTNING.

In connection with the preceding note Mr. Heiskell, of the Weather Bureau, sends the following description of two interesting cases of lightning:

During the evening of Sunday, August 26, 1900, while near Gapland, Md., on the east slope of the Blue Ridge Mountains (12 miles north of Weverton) I saw a most beautiful display of lightning without thunder; the flashes appeared in the southwest corner of the valley known as Middletown Valley, followed the Potomac River and mountains on the Virginia side, then passed to the Blue Ridge at Weverton and followed the mountain top, making a circuit of at least 60 miles, this appeared to occur twice, when gradually the flashes spread, as it were, to the valley, in appearance resembling the discharge of a roman candle. This most beautiful phenomenon lasted from about 7 to 10:30 p. m., and when near the house the light was so vivid that at times one could easily have read a book. An old resident remarked that whenever they had such "lightning storms" it purified the air, and the next day was always bright and clear.

This display of lightning without thunder recalls a thunderstorm that occurred several years ago in the Blue Ridge Mountains in the month of July. I was on a train going to Emmitsburg, Md.; when we changed cars at Rocky Ridge, the sky was heavily overcast with large cumulo-nimbus clouds. As we moved along by the side of the mountain, about 1 mile distant, a terrible thunderstorm, accompanied by high wind, burst before us. The lightning was so vivid as to be nearly blinding, and as the storm or clouds followed the mountains the lightning appeared to those on the train to leap from peak to peak, in fact several persons remarked "that mountain must be full of iron." The storm passed off over Emmitsburg and the sun came out as bright and hot as before.

THE FRENCH EDITION OF THE MONTHLY WEATHER REVIEW.

The publication of the MONTHLY WEATHER REVIEW, which began with the number for January, 1873, compiled by the present Editor, was soon recognized as an important means of bringing before the world a general summary of the work done by the Weather Bureau, at that time a part of the Signal Service. The enlargement of the REVIEW, in 1875, enabled it to include the results of observations by voluntary observers, and also notes and extracts from current meteorological observations, and it became widely recognized as a model for other nations to copy and improve upon. In 1878, Gen. A. J. Myer, the Chief Signal Officer, and head of the Weather Bureau, thought it important to try the experiment of translating the REVIEW into French and publishing an international edition. The labor and expense attending this experiment was subsequently found to be prohibitive, but the few copies of this edition that are still to be found in the libraries mark one of the many interesting episodes in the history of the Weather Bureau. Unfortunately, the copy of the French edition that formerly belonged to the library of the Weather Bureau has mysteriously disappeared, and the Librarian joins with the Editor in the hope that several of our numerous correspondents have, or know of, copies for sale or exchange. We would esteem it a favor to be apprised of the fact, so that we may be enabled to complete our files.

RAFINESQUE ON ATMOSPHERIC DUST.

In Science for August 10, 1900, Mr. Wm. J. Fox gives a complete table of contents, with occasional notes of Vol. I, No. 1, of Rafinesque's *Western Minerva, or American Annals of Knowledge and Literature*. This was published at Lexington, Ky., in January, 1821, and was to have been the first number of a long series, but some trouble with the printer unfortunately prevented any further publication.

Professor Rafinesque occupied a prominent place in American science. He was born of French parents in Turkey, in 1784, came to America in 1802, and spent several years making botanical collections. He went back to Europe and returned to New York in 1815, but was unfortunately wrecked on the coast of Long Island, where he lost the collections that represented twenty years of work. He was then, for a time, Professor of Botany in Transylvania University at Lexington, Ky., but soon removed to Philadelphia,

where he died in 1842. The periodical whose title is given above has a slight interest for meteorologists, in that it contains a letter on atmospheric dust, addressed to Governor DeWitt Clinton, Albany, N. Y., and which is the second article that Rafinesque seems to have written. At that time dust was considered as a matter that interested the geologist rather than the meteorologist, but the interest taken in this subject since the great eruption of Krakatoa, and especially, the demonstration that the presence of dust materially contributes to facilitate the formation of rain and snow, to increase the radiation and absorption of heat, and to affect the percentage of polarized light justifies the modern meteorologist in considering the dust floating in the air as being quite as essential a portion of the atmosphere with which he has to deal as is the moisture or any other variable component. It is customary to state with great precision the chemical constitution of the so-called dry air, but this term should now be modified and made more explicit by using the phrase "dry and dustless air." In his *Philosophy of Storms*, Boston, 1841, on page 36, Espy states that to his astonishment, it was much more difficult to secure saturated air by expansion in his nepheloscope after the air had been kept a long time, and had frequently been brought into the cloudy condition. We now know that this was due to the fact that by keeping the air quiet, and especially, by his frequent production of cloudy condition by expansion he must have almost wholly cleansed the air of dust, so that eventually he was experimenting with dustless air, thereby producing, as it seemed to him, a decided fall in the dew-point. He suspected that the water or glass of his enclosure attracted and condensed the particles of aqueous vapor; he had not then learned the importance of dust in facilitating condensation.

Although Rafinesque looked at the atmospheric dust from another point of view, yet, his views also have some interest in connection with the history of this subject. The *American Journal of Science* began with the publication of Volume I, No. 1, in July, 1818. In the fourth number of this first volume, published in June, 1819, Professor Rafinesque, who was at that time probably living in Lexington, Ky., published his first article "Thoughts on atmospheric dust." This gives results to which he had attained years before, viz:

That in general dust is falling at all times from the atmosphere; that atmospheric dust exists on the tops of the highest mountains; that a portion of it, if not all, is chemically formed in the atmosphere like snow, hail, meteoric stones, honey-dew, earthy rains, etc., by the combination of gaseous and elementary particles dissolved in the air; its formation is sometimes very rapid and its accumulation very thick in the lower strata of the atmosphere; it settles slowly to the ground in clear weather, but is quickly washed down by rain or snow; its accumulation in a quiet room varied from one-fourth of an inch to one inch in depth in the course of one year; but this was in a fleecy state and might by compression be reduced to one-third of this height, or perhaps one-sixth of an inch per annum; on an average from 6 to 12 inches thus accumulate in a century and mix with the soil to form mold; at Segesta in Sicily there is a temple about which from 5 to 8 feet of hard soil or aerial deposit has accumulated in 2,000 years, notwithstanding the washings of rain; the dust of the open air is ordinarily ascribed to the pulverization of the surfaces of roads and fields; other dust comes from the fragments of material consumed in the activity of mankind, but whence arises the dust observed by means of sunbeams in dark corners in winter, when the ground is frozen, or at sea or on the tops of rocky mountains. Just as the sea deposits particles that eventually form rocks so the air deposits a more delicate pulverulent matter.

On pages 134-136 of the first number of the second volume, of Silliman's *American Journal*, published in April, 1820, we find a reply to Professor Rafinesque by an anonymous correspondent, "X. Y. Z.," of Boston. He maintains that all dust comes from the action of the wind in raising up fine particles from the ground, and that even the dust seen at sea has the same origin, being capable of floating while being carried 1,500 miles over the Atlantic; he also asks:

If 9 feet of earth accumulate from the dust in 1800 years, then, how happens it that rocks and stones are everywhere to be met with? Are